Adaptive Seismic Compression By Wavelet Shrinkage

Khene, M.F. Abdul-Jauwad, S.H.;Dept. of Electr. Eng., King Fahd Univ. of Pet.Miner., Dhahran;

Statistical Signal and Array Processing, 2000. Proceedings of the Tenth IEEE Workshop on;Publication Date: 2000;ISBN: 0-7803-5988-7

King Fahd University of Petroleum & Minerals

http://www.kfupm.edu.sa

Summary

In this paper, a sophisticated adaptive seismic compression method is presented based on wavelet shrinkage. Our approach combines a time-scale transform with an adaptive non-linear statistical method. First, a discrete 2-D biorthogonal discrete wavelet transform (DWT) is applied to the multi-channel seismic signals to generate a sparse multiresolution (subband) decomposition. Compression is then achieved by shrinking the detail wavelet coefficients using a scale-dependent non-linear soft-thresholding rule. The adaptive scale-dependent thresholds are determined by minimizing the Stein's unbiased risk estimate (SURE). The proposed compression procedure is tested on marine seismic data from the Midyan basin (Red Sea, Saudi Arabia)